Project Title: **Super-Absorbent, Reusable Foams for Separations and Cleanup**
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Argonne National Laboratory has invented a surface treatment technology for polymer foams that dramatically improves oil absorption while reducing water absorption, yielding a highly efficient and reusable product for oil cleanup. More broadly, this surface treatment can be tailored for the removal or separation of targeted compounds in a complex mixture. This will provide solutions to problems in the bioenergy and oil & gas industries. AquaFlex Holdings LLC has a diverse range of foam products that can be enhanced using the Argonne surface treatment. In this TCF project, Argonne will partner with AquaFlex to develop engineered foam products for the bioenergy and oil & gas industries.

For bioenergy, the AquaFlex open cell foams will be engineered using Argonne's surface treatment to selectively adsorb targeted organic components from a complex liquid mixture. This will enable energy efficient and reusable separations in biofuels processing for mixtures including lignin-derived aromatics, aliphatic acids, aliphatic aldehydes alcohols, and water. Hydraulic fracturing used in the oil and gas industries generates water contaminated with oils and heavy metals. Both of these contaminants can be selectively removed from the water using engineered foams with surface treatments that target these species. In addition, oil spills from offshore drilling that contaminate the surface or subsurface water column can be effectively removed by cheap, reusable engineered foams.